
Space Weather Forecast

Issued on Thursday 27 February 2025 at 01:24 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Isolated Moderate-class flares likely. Slight chance of G1 Minor Storms, most likely days 1 and 2 (27-28 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with occasional Common-class flares. There are currently eight sunspot regions on the Earth-facing disc. Most regions have generally been showing a simplifying and weakening trend, or have been stable. The most likely flare source is from a region in the southwest, which is the largest region on the disc, however this region is expected to rotate over the southwest limb day 2 (28 Feb), reducing the flare probabilities. The next most complex is in the northeast, with some mixing of polarities through its intermediate spots, however this has remained stable and relatively inactive. The other regions are much smaller and simpler.

There have been three coronal mass ejections (CMEs) of note. First, a filament eruption, just west of centre disc, was observed around 26/0600 UTC, this is most likely expected to pass ahead of Earth's orbit, with a slight chance of a glancing blow. This was followed by a filament eruption in the southwest around 26/1445 UTC and again is considered most likely to pass ahead of Earth but a glance can not be completely ruled out. Finally, a filament in the southeast saw some ribbon flaring on the edge of a coronal hole, this is believed to pass behind Earth's orbit.

Solar Wind / Geomagnetic Activity: The solar wind showed some weak CME influence, and potentially the first signs of the onset of faster solar winds from one of the coronal holes on the Earth-facing disc. Background solar wind speeds were observed until 26/1140 UTC, before rising to be slightly elevated at near 430 km/s. Interplanetary Magnetic Field was Moderate until 26/0630 UTC, when a gradual increasing trend was observed becoming Strong by 26/1200 UTC. The north-south component was mainly Weak to Moderately southward, before rotating to be mainly Moderate to Strong northward from 26/1015 UT. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

The solar wind,, showed potentially the first signs of a connection to the first of the coronal hole features on the disc, likely the unnumbered features in the northwest. Background solar wind speeds were observed until 26/1140 UTC, before rising to be elevated at near 580 km/s. Interplanetary Magnetic Field, was Moderate until 26/0630 UTC, when a gradual increasing trend was observed becoming Strong by 26/1200 UTC. This shortly dropped back to Moderate levels by 26/1300 UTC. The north-south component was largely weak to moderately variable throughout. Geomagnetic activity was Quiet to Unsettled (Kp 2-3).

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was above background levels, but below the S1/Minor Radiation Storm and declining.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is forecast with isolated Moderate-class flares likely at first, reducing to a chance of isolated Moderate-class flares by day 3 (01 Mar).

Solar Wind / Geomagnetic Activity: Glancing CME influences are currently not expected, but can't be completely ruled out days 1-2 (27-28 Feb) from the Moderate flare/filament eruption on 24 Feb as well as a further potential glancing blow from the filament eruption on 26/1445 UTC. The main upcoming enhancement from a fast wind connection to a coronal hole is likely on days 1-2 (27-28 Feb), with Strong wind speeds of over 600km/s expected. Wind speeds are likely to remain elevated or strong for the rest of the period, once the fast wind connects with Earth. Quiet to Unsettled geomagnetic activity is expected with Active intervals, most likely with the coronal hole onset Days 1-2 (27-28 Feb).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is expected to continue declining towards background. There remains a slight chance of further enhancements.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	20	20	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	No	55	55	50	50
Very Active	R3-R5 (X Class)	No	5	5	1	1

Solar Radiation Storms (High Energy Protons)

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = cm ⁻² sr ⁻¹ s ⁻¹)						